

REMARKS

Claim 31 is cancelled. Claims 1, 4 and 18-20 are amended. Claims 1-20, 22-24, 28 and 30 are now under consideration and are the only claims in this application.

The specification is amended to update the reference to the parent applications. The applications referenced are disclosed in the Declaration of the present application.

An appendix is attached with marked-up sections of the specification and claims. Deletions are shown with strike-through and additions are shown with underlining.

Rejections under 35 USC § 112

Claim 31 is rejected under 35 USC § 112, second paragraph, for reasons of record.

Claim 31 is also rejected under 35 USC § 112, first paragraph, for reasons of record.

Claim 31 is cancelled.

Claims 1-20, 22-24, 28, 30 and 31 are rejected under 35 USC 112, first paragraph, for reasons of record, paragraphs 3. and 16. of the Office Action.

The Examiner states that Applicants have failed to provide adequate enablement with respect to how the process is controlled so that crosslinking or thermosetting does not occur.

The Examiner goes on to state that the present claims contain subject matter which was not described in the specification in such a way as to reasonably convey to the skilled artisan that the inventors had possession of the claimed invention at the time of filing. The Examiner states that it is unclear whether "thermoformable" is equivalent to "thermoplastic", it is unclear as to the degree of crosslinking which may be present within a thermoformable polymer, and it is unclear as to what characteristics and properties are exhibited by the present thermoformable polymers.

Claim 1 is amended to state that the polymers or copolymers remain in the thermoplastic state after the process, which process comprises heating said polymers or copolymers in a mixer or extruder to the melting point or up to 50°C above the melting point or 50°C to 150° above the glass transition point. Basis for the specific temperature ranges is found in the paragraph bridging pages 27 and 28 of the specification. The added reference to "mixer or extruder" finds support in the same paragraph and in the working Examples.

The term "thermoformable" is replaced with "thermoplastic state". Applicants aver that the term "thermoformable" is interchangeable with "thermoplastic" since thermoplastic polymers can per definition be formed into the desired shape by applying heat. The polymers that are a subject of the present claims are well known thermoplastic polymers. Further, the presently claimed process is now characterized by the device employed, that is a mixer or extruder. It is therefore clear that the present term "thermoformable" means the well known term "thermoplastic". Polymers must be thermoplastic polymers in order to use such equipment.

Applicants also point out that in present working Examples 1 and 2 that melt index of the processed polymers is measured. Since this measurement can only be done when the polymer is a flowing melt upon heating, it is clear that the polymer is thermoplastic, that is "formable" upon heating, i.e. "thermoformable". Applicants submit that any potential degree of crosslinking is moot in light of the fact that the present polymers or copolymers remain thermoplastic as a result of the instant process.

In short, the present working Examples clearly demonstrate that the polymers are thermoplastic before the present process and remain thermoplastic after the process.

No new matter is added to claim 1 as a result of the amendments discussed above.

In view of the present amendments and the above discussion, Applicants submit that the 35 USC § 112 rejections are addressed and are overcome.

Rejections under 35 USC § 102(b) and 35 USC § 102(e)

Claims 1, 4-9 and 31 are rejected under 35 USC 102(b) as anticipated by JP Hei 1-6019 or Gerth, et al. ('267) or Pujol, et al. ('785) or Emori, et al. ('684).

Claims 1, 4-9, 18 and 31 are rejected under 35 USC 102(b) or 35 USC 102(e) as anticipated by Ikeguchi, et al. ('658 or '669) or Kramer, et al. ('346) or Powell, et al. ('635) or Matsuoka, et al. ('548).

Claims 1, 4-9, 18, 23 and 31 are rejected under 35 USC 102(b) as anticipated by Gaku, et al. ('769).

Claims 1, 4-9, 18, 22 and 31 are rejected under 35 USC 102(b) as anticipated by Khanna, et al. ('896).

Claims 1, 4-9, 23 and 31 are rejected under 35 USC 102(b) as anticipated by Blahak, et al. ('001) or Gaku, et al. ('805 or '609).

Claims 1, 4-9, 22, 23 and 31 are rejected under 35 USC 102(b) as anticipated by EP 386,358 or Kitagawa, et al. ('555).

Applicants submit that all of the above cited references, except Powell, et al. ('635), are aimed at cured or curable resins or resin systems. Claim 1 in its present amended form, stating that the present polymers or copolymers remain in the thermoplastic state with the specific process conditions cited, is not anticipated by the cited references. Powell, et al. discloses polycarbonate compositions. Present claim 1 no longer contains polycarbonate.

In light of the amendments to the present claims, Applicants aver that the 35 USC § 102(b) and 35 USC § 102(e) rejections are addressed and are overcome.

The deletion of "polycarbonate" from the present claims is not an admission regarding patentability. Applicants reserve the right to file a further divisional application in order to claim the subject matter deleted in the present amendment.

Rejections under 35 USC § 103(a)

Claims 1-13, 16-20, 22-24, 28, 30 and 31 are rejected under 35 USC 103(a) as obvious over EP 604,367 or WO 95/35343 in view of the references cited under the 35 USC 102(b) rejections.

The Examiner states that the primary references disclose the blending of phosphonic esters of diphosphonites, optionally with difunctional epoxides, with polycondensates to increase the molecular weight of the polycondensates. The Examiner further states that it is obvious to the skilled artisan to combine the aromatic dicyanates into the compositions of the primary references to arrive at the present invention.

Applicants respectfully traverse the rejections.

Again, all of the secondary references (except Powell for polycarbonate) disclose the use of dicyanates or polycyanates for curable resins such as thermosetting resin compositions. Curable resin compositions are, however, crosslinked and do not remain processable via an extruder. Nor do they melt or flow upon applying heat.

The cured resin systems of the secondary references are useful for adhesives, coatings, solder masks and for fiber reinforced plastics, all applications requiring crosslinked systems.

The skilled artisan, with the secondary references in hand, can only conclude that dicyanates are useful crosslinking agents useful for providing fully cured resins. The secondary references do not provide any motivation towards the use of a dicyanate for increasing the molecular weight of polyamides or polyesters that should remain in the thermoplastic state, in contrast, they teach away from the present invention.

Again, the instant invention has solved the problem of increasing the molecular weight and/or viscosity of a polyamide or a polyester or a copolymer of these polymers by adding a dicyanate and processing the mixture in the molten state under certain conditions. The polymers thereby remaining thermoplastic polymers having a higher molecular weight. This solution is neither disclosed nor suggested by any combination of the cited references.

The primary references, EP 604 367 and WO 95/35343, disclose a process of increasing the molecular weight of a polycondensate polymer, however they use chemically totally different additives for this purpose, namely diepoxides and dianhydrides.

Since the relevant secondary references are all aimed at cured or curable resins or resin systems, those skilled in the art would not be motivated to combine the secondary references with the primary ones in order to solve the present problem of increasing the molecular weight of polyamides and polyesters and copolymers thereof.

In light of the present amendments to the claims and the above discussion, Applicants submit that the 35 USC § 103(a) rejections are addressed and are overcome.

Applicants submit that in light of the present amendments and all of the above discussion, that the 35 USC § 112, first and second paragraph, 35 USC § 102(a), 35 USC § 102(e) and 35 USC § 103(a) rejections are all addressed and are overcome.


Applicants respectfully request the Examiner to reconsider and to withdraw the rejections.

Applicants aver that the present claims are in condition for allowance and respectfully request the Examiner to find them allowable.

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Attachments: Appendix with marked-up specification sections and claims



CASE 1-20746/A/CGM 471/CIP

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF
RUDOLF PFAENDNER ET AL
APPLICATION NO: 09/703,782
FILED: NOVEMBER 1, 2000
FOR: PROCESS FOR INCREASING THE
MOLECULAR WEIGHT OF
POLYCONDENSATES

Group Art Unit: 1711
Examiner: R. Sergent

Commissioner for Patents
Washington, D.C. 20231

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APPENDIX
Marked-up Specification Sections and Claims

Specification

Page 1, first paragraph (first line after the title):

--This is a continuation-in-part of application Serial No. 09/125,178, filed August 12, 1998,
which is a 371 of PCT/EP97/00492, filed Feb. 4, 1997.--

Claims

1. (amended) A process for increasing the molecular weight and/or viscosity of a polyamide or, a polyester, a polycarbonate or a copolymer of these polymers which remain in the thermoplastic state ~~thermoformable~~ after the process, which process comprises heating in a mixer or extruder a polyamide or, a polyester, a polycarbonate or a copolymer of these polymers, with the addition of at least one aromatic dicyanate, to the at above the melting point or up to 50°C above the melting point

or 50°C to 150°C above the glass transition point of said polymers or copolymers~~the polyamide, polyester, polycarbonate or copolymer of these polymers.~~

4. (amended) A process according to claim 1, wherein the polyamide or, polyester, ~~polycarbonate~~ or a copolymer of these polymers is a polyamide- or, a polyester, ~~a polycarbonate~~ or a copolymer of these polymers-recyclate.

18. (amended) A process according to claim 1, wherein from 0.01 to 5 parts by weight of the aromatic dicyanate are employed per 100 parts by weight of a polyamide or, a polyester, ~~a polycarbonate~~ or a copolymer of these polymers.

19. (amended) A process according to claim 2, wherein from 0.01 to 5 parts by weight of the polyfunctional compound are employed per 100 parts by weight of a polyamide or, a polyester, ~~a polycarbonate~~ or a copolymer of these polymers.

20. (amended) A process according to claim 3, wherein from 0.01 to 5 parts by weight of the difunctional epoxide are employed per 100 parts by weight of a polyamide or, a polyester, ~~a polycarbonate~~ or a copolymer of these polymers.